Original Article

TRANSLATIONAL&PRACTICAL MEDICINE

DOI: 10.51271/JTPM-0051
J Transl Pract Med. 2023;2(3):107-113

Association of chronic disease self-management with health locus of control study on diabetic patients

Zehra Saygılı, Ali Yılmaz

Department of Health Management, Faculty of Health Sciences, Kırıkkale University, Kırıkkale, Turkey

Cite this article as: Saygılı Z, Yılmaz A. Associatıon of chronic disease self-management with health locus of control study on diabetic patients *J Transl Pract Med.* 2023;2(3):107-113.

Received: 24/11/2023 • **Accepted**: 27/12/2023 • **Published**: 31/12/2023

ABSTRACT

Aims: It was aimed at determining the relationship between chronic disease self-management and health locus of control in diabetic patients.

Methods: Data were collected by the face-to-face survey method from diabetic patients over the age of 18 who were receiving inpatient treatment in a public hospital.

Results: According to the research results; the total score average of the participants from the chronic disease self-management scale was moderate (mean: 64.11 Min: 21-Max: 105), w but treatment compliance (mean:15.81 Min:5-Max:25)) was found to be at a medium level. The participants' internal locus of control score (mean: 25.08, Min: 9-Max: 36) was found to be higher than other sub-dimensions. As a result of the correlation analyses carried out; statistically significant relationships were obtained between chronic disease self-management total and sub-dimensions and health locus of control sub-dimensions.

Conclusion: Statistically significant relationships were obtained between the chronic disease self-management total and sub-dimensions and the health locus of control sub-dimensions. It can be said that the participants have more internal locus of control beliefs.

Keywords: Diabetes, health care focus, chronic disease self-management

INTRODUCTION

The World Health Organization defines chronic diseases as conditions that cannot be treated medically, progress over time, require support and follow-up to control the disease and maximize the patient's responsibilities, and affect daily life.[2,5] The most common chronic diseases in the world include diabetes, cancer, chronic obstructive pulmonary disease (COPD), and cardiovascular diseases.[7]

In order to improve health outcomes, health behaviors, and quality of life in chronic diseases, it is important that the individual's self-management be developed. Chronic disease self-management is an approach that aims to enable the individual to manage the care and treatment of his/her disease, to regulate his/her lifestyle socially, physically, and psychologically, to develop activities that center the patient, to prevent or reduce the health risks that may occur, and to improve his/her health and quality of life.[20,14] When self-management increases, positive results in treatment increase, quality of life and health outcomes improve, and health service utilization and social cost burden decrease.[27,9,3]

The individual with chronic disease sees himself/herself as responsible for the situation he/she is experiencing in relation to his/her health and places himself/herself in the center or looks for other factors outside. The concept of health locus of control was developed to explain these behaviors of the individual in the face of the disease.[25]

The Julian Rotter-developed social learning theory, which explains the beliefs that guide individual and long-term behaviors related to health, is where the health locus of control originated.[4] The health locus of control includes a personality factor that the individual develops over time and includes social learning experiences. It focuses on explaining to whom the person attributes control in the disease process, the source of their expectations about their health status, the positive or negative situation they face, the factors that affect behavior or outcomes, and the belief that control belongs to whom. While some individuals think that they themselves are effective in their well-being or illness, some individuals think that other external factors influence and manage the disease.[8,13,26] Individuals with a developed health locus of control are more successful in

Corresponding Author: Zehra Saygılı, esyglzhr@gmail.com

This work is licensed under a Creative Commons Attribution 4.0 International License.

showing health-protective and health-promoting behaviors, approving and complying with treatment, and avoiding and adapting to health-damaging behaviors.[13,15]

With the aging population, sedentary lifestyle, and increasing obesity, diabetes has become a global epidemic and a major health crisis.[11,12] Diabetes is a rapidly growing socio-economic problem that creates a huge economic burden.[10] It is estimated that the number of patients with diabetes in the world will be 536.6 million in 2021, and this number will be 783.2 million in 2045.[28] Diabetes rates are also rising rapidly in Turkey. According to data from the International Diabetes Federation, there are 7 million diabetic patients between the ages of 20-79 in Turkey. Especially 80% of Type 2 diabetes cases are preventable. It is possible for countries to minimize the negative consequences of patients with diabetes individually and socially, to increase the quality of life of patients, to develop human resources, which are important for sustainable economic development, and to minimize the negative impact on economic development.[29]

METHODS

This study is a cross-sectional exploratory study conducted with primary data. The aim of the study is to determine the relationship between socio-demographic characteristics, chronic disease self-management levels, health locus of control, health locus of control and chronic disease self-management of diabetes patients. In order to carry out this research, Ethics Committee Approval was received from Kırıkkale University Non-invasive Researches (Date: 21.12.2022, Decision No: 2022.12.01). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki. The research covers diabetes patients over the age of 18 who were treated in Kırıkkale High Specialization Hospital Internal Medicine Department inpatient services between December 15, 2022, and March 30, 2023, and who voluntarily agreed to participate in the research. Data were collected by the face-to-face questionnaire method. The questionnaire consists of three parts: a personal information form, a chronic disease self-management scale, and a health locus of control scale. The Chronic Disease Self-Management Scale was developed by Ngai et al. (2020). The Turkish validity and reliability of the scale were conducted by Öztürk et al.[19] in 2021. The Health Locus of Control Scale was developed by Wallston et al.[6] in 1978, and its Turkish validity and reliability were performed by Güzel.

Statistical Analysis

In order to evaluate the normal distribution of the data in the study, kurtosis and skewness values were calculated for the sub-dimensions and total scores of each scale. The values of the chronic disease self-management scale were calculated as 0.209–1.878, and the values of the multidimensional health locus of control scale were calculated as -0.697–0.797. According to these results, the data show a normal distribution. Cronbach's alpha values were calculated to determine the reliability of the scales and found to be between 0.76-0.923.

RESULTS

The socio-demographic data of the participants are given in Table 1.

Table 1. Socio-demographic characteristics of participants

	N	%	Total
Gender			
Male	140	48.8	**287**
Female	147	51.2	
Age			
35 years and below	39	13.6	**287**
36-50 years old	85	29.6	
51-65 years old	104	36.2	
66-81 years old	59	20.6	
Marital Status			
Married	193	67.2	**287**
Single	94	32.8	
Education Status			
High school and below	211	73.5	**287**
Associate degree	46	16.0	
Bachelor's degree	30	10.5	
Income Groups			
Under 7500 ₺	64	22.3	**287**
7500-14999 ₺	158	55.1	
15000 ₺ and above	65	22.6	
Social Security			
SSI	267	93.0	**287**
Private insurance	6	2.1	
No	14	4.9	
Diabetes type			
Type 1	10	3.5	**287**
Type 2	277	96.5	
Concomitant Disease			
Yes.	118	41.1	**287**
No	169	58.9	
Place of residence			
Province	180	62.7	**287**
District	95	33.1	
Neighborhood (village)	12	4.2	

51.2% of the participants were women, 36% were between the ages of 51-65 with a mean age of 52.31, 67.2% were married, 73.5% had high school education or less, 55.1% had an income between 7.500-14.999 TL, 93.0% were covered by SSI, 96.5% had type II diabetes, 41.1% had comorbidities, and 62.7% resided in the city center. When the occupations of the participants are analyzed, it is seen that 39% of the participants are housewives, 29.0% are retired, and 2% are teachers, students, tradesmen, guards, and hairdressers. The distribution of occupations is given in Figure 1.

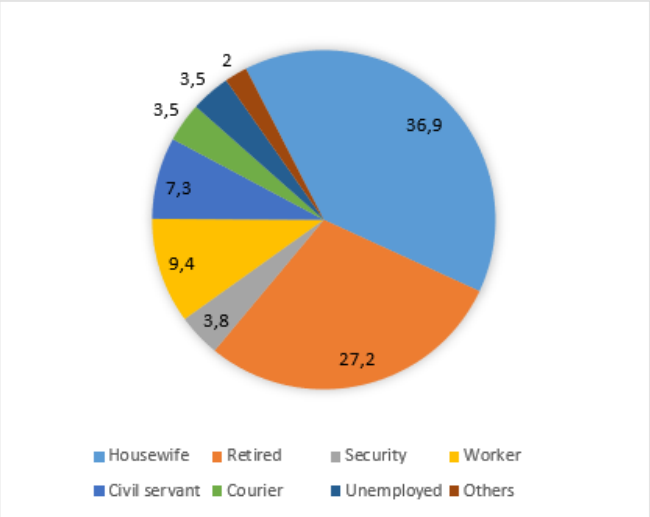

Figure 1. The distribution of occupations

When the comorbidities of diabetes patients were analyzed, it was seen that 77% of 287 diabetes patients had hypertension, 87.1% had heart failure, 94.8% had asthma, and 91.6% had chronic renal failure. Comorbidities are given in Figure 2.

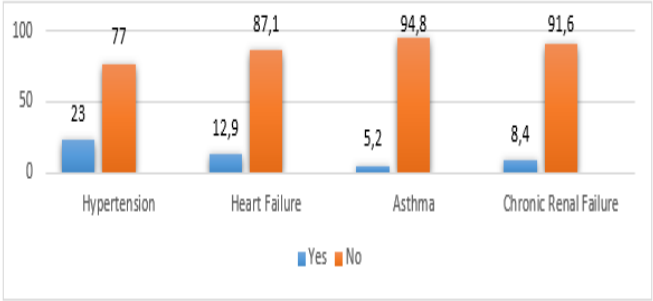

Figure 2. Comorbidities

Findings regarding participants' chronic disease self-management and health locus of control are given in Table 2.

The mean total score obtained by the participants from the chronic disease self-management scale was moderate (mean: 64.11±5.4 min: 21 max: 105). Among the sub-dimensions, self-stigmatization (mean: 20.80±4.2 min: 9 max: 33), coping with stigmatization (mean: 16.39±3.4 min: 9 max: 25), and health care effectiveness (mean: 12.73±2.7 min: 8 max: 20) were at a low level, but compliance with treatment (mean: 15.81±4.0 min: 5 max: 25) was at a moderate level. The participants' internal locus of control sub-dimension score (mean: 25.08±5.2 min: 9 max: 36) was found to be higher than the other sub-dimensions. According to these results, it can be said that the participants have more internal locus of control beliefs.

Table 2. Participants' chronic disease self-management and health locus of control levels

	N	Min.	Max.	Mean	SD
Chronic disease self-management scale	287	21	105	64.11	5.4
Self-stigmatization	287	9.0	33.0	20.80	4.2
Dealing with stigmatization	287	9.0	25.0	16.39	3.4
Health care effectiveness	287	8.0	20.0	12.73	2.7
	N	**Min.**	**Max.**	**Mean**	**SD**
Treatment compliance	287	5.0	25.0	15.81	4.0
Internal locus of control	287	9.0	36.0	25.08	5.2
Luck locus of control	287	11.0	35.0	23.45	4.8
Locus of control of significant others	287	8.0	25.0	19.29	2.1

The relationship between chronic disease self-management and health locus of control sub-dimensions was evaluated by Pearson correlation analysis, and the results are given in Table3.

According to the results of the Pearson correlation analysis in Table 3 (**. p<0.01), there is a moderately significant positive relationship between the total chronic disease self-management and self-stigmatization sub-dimensions (r=0.504; p=0.000). As patients' self-stigmatization behaviors related to their diseases increase, chronic disease self-management increases moderately.

There is a positive, low-level, significant relationship between the total chronic disease self-management and the coping with stigmatization sub-dimension (r=0.337; p=0.000). As the patients' ability to cope with stigmatization increases, chronic disease self-management power also increases, albeit slightly.

There is a positive, low-level, significant relationship between the total chronic disease self-management and the health care effectiveness sub-dimension (r=0.193; p=0.001). As the health care activities of the patients increase, their chronic disease self-management power also increases, albeit slightly.

Table 3. The relationship between chronic disease self-management and health locus of control sub-dimensions

		1	2	3	4	5	6	7	8	
Chronic disease self-management total (1)	**r**	1								
	p									
	n	287								
Self-stigmatization (2)	**r**	**.504****	1							
	p	.000								
	n	287	287							
Dealing with stigmatization (3)	**r**	**.337****	**-425****	1						
	p	.000	.000							
	n	287	287	287						
Health care effectiveness (4)	**r**	**.193****	**-423****	**.675****	1					
	p	.001	.000	.000						
	n	287	287	287	287					
Treatment compliance (5)	**r**	**-.402****	**-.281****	**.418****	**.562****	1				
	p	.000	.000	.000	.000					
	n	287	287	287	287	287				
Internal control (6)	**r**	.066	**-.220****	**.439****	**.577****	**.454****	1			
	p	.263	.000	.000	.000	.000				
	n	287	287	287	287	287	287			
Luck check (7)	**r**	.027	**.284****	**-.389****	**-.524****	**-.435****	**-.440****	1		
	p	.646	.000	.000	.000	.000	.000			
	n	287	287	287	287	287	287	287		
Important others (8)	**r**	**.785****	**.615****	**.176****	.026	**-.245****	.073	.042	1	
	p	.000	.000	.003	.661	.000	.215	.480		
	n	287	287	287	287	287	287	287	287	

**. significant correlation at p<0.01 level

There is a moderately significant positive relationship between the total chronic disease self-management and the treatment compliance sub-dimension (r=-0.402; p=0.000). As the patients' compliance with their treatment increases during their illness, their chronic disease self-management power increases moderately.

There is a highly significant positive relationship between total chronic disease self-management and the important other locus of control sub-dimension (r=0.785; p=0.000). As the level of patients' relinquishing control over their sick and healthy state to health professionals, family, or friends increases, the degree of chronic disease self-management also increases strongly. No significant relationship was found between the total chronic disease self-management and internal locus of control (r=0.066; p=0.263) and chance locus of control (r=0.027; p=0.646) sub-dimensions.

There is a negative and low-level significant relationship between self-stigmatization and the internal locus of control sub-dimension (r=-0.220; p=0.000). As the patients' belief that they are in control of their own health increases, their self-stigmatization behaviors decrease slightly.

There is a positive, low-level, significant relationship between self-stigmatization and the sub-dimension of luck control (r=0.284; p=0.000). As the patients' belief that luck controls their health increases, their self-stigmatization behaviors increase slightly.

There is a moderately significant positive relationship between self-stigmatization and the important other sub-dimensions (r=0.615; p=0.000). As the level of patients' leaving the control of being sick and healthy to health professionals, family, or friends increases, the level of self-stigmatization increases moderately.

There is a positive and moderately significant relationship between coping with stigmatization and the internal locus of control sub-dimension (r=0.439; p=0.000). As the patients' belief that they are in control of their own health increases, their level of coping with stigmatization increases moderately.

There is a negative and low-level significant relationship between coping with stigmatization and the locus of control sub-dimension of luck (r=-0.389; p=0.000). As the patients' belief that luck controls their health increases, their level of coping with stigmatization decreases slightly.

There is a positive and low-level significant relationship between coping with stigmatization and the important other locus of control sub-dimension (r=0.176; p=0.003). As the level of patients' leaving the control of being sick and healthy to health professionals, family, or friends increases, the level of coping with stigmatization increases slightly.

There is a moderately significant positive relationship between health care effectiveness and the internal control sub-dimension (r=0.577; p=0.000). As the patients' belief that they are in control of their own health increases, their health care efficiency increases moderately.

There is a negative and moderately significant relationship between health care effectiveness and the sub-dimension of chance control (r=-0.524; p=0.000). As the patients' belief that luck controls their health increases, their health care activities moderately decrease.

No relationship was found between health care effectiveness and the important other control sub-dimension (r=0.026; p=0.661).

There is a moderately significant positive relationship between treatment adherence and the internal control sub-dimension (r=0.454; p=0.000). As the patients' belief that they are in control of their own health increases, their compliance with treatment increases moderately.

There is a negative and moderately significant relationship between treatment adherence and the chance control sub-dimension (r=-0.435; p=0.000). As the patients' belief that luck controls their health increases, their adherence to treatment moderately decreases.

There is a negative, low-level significant relationship between treatment adherence and the important other control sub-dimension (r=-0.245; p=0.000). As the patients' level of relinquishing control of being sick and healthy to health professionals, family, or friends increases, their compliance with treatment decreases slightly.

DISCUSSION

Self-management is a comprehensive concept that basically includes treatment of the disease, physical and social consequences, and adaptation to lifestyle changes. Self-stigmatization, coping with stigmatization, the effectiveness of health care, and compliance with treatment are critical elements in chronic disease self-management.[17] In this study, it was observed that the mean total score of the participants obtained from the chronic disease self-management scale was moderate (mean: 64.11±5.4; min: 21; max: 105). Among the sub-dimensions, self-stigmatization (mean: 20.80±4.2 min: 9 max: 33), coping with stigmatization (mean: 16.39±3.4 min: 9 max: 25), and health care effectiveness (mean: 12.73±2.7 min: 8 max: 20) were at a low level, but compliance with treatment (mean: 15.81±4.0 min: 5 max: 25) was at a medium level. Therefore, it was concluded that patients with diabetes had low levels of self-stigmatization, coping with stigmatization, health care effectiveness, a moderate level of treatment compliance, and a moderate level of chronic disease self-management total score.

The locus of control investigates who or what controls the health behavior of individuals. The internal locus of control sub-dimension score of the participants was found to be higher than the other sub-dimensions. According to this result, it is seen that the participants have more internal locus of control beliefs. Therefore, it indicates personality traits that tend to perceive behavioral outcomes and events depending on their own behaviors or personality traits instead of perceiving them depending on fate, luck, and other powerful people and events. In a study conducted by Petricek et al.[21] with type 2 diabetic patients, the internal locus of control was the highest in participants, followed by the locus of control of luck and strong others, respectively. Trento et al.[24] found that the participants' internal locus of control belief was higher than other loci of control.

When the relationship between the chronic disease self-management dimension and its sub-dimensions and the health locus of control sub-dimensions is examined, a strong positive relationship was found between the chronic disease self-management total and important other locus of control sub-dimensions (r=0.785). There is a moderately positive relationship between treatment adherence and the internal control sub-dimension (r=0.454). There is a moderately negative relationship between treatment compliance and the chance control sub-dimension (r=-0.435). There is a low-level negative relationship between treatment adherence and important other control sub-dimensions (r=-0.245). There is a moderately positive relationship between coping with stigmatization and the internal control sub-dimension (r=0.439). A moderately positive relationship was found between health care effectiveness and the internal control sub-dimension (r=0.577). In the study conducted by Morovatisharifabad et al.[16], a positive relationship was found between internal locus of control and adherence to the diabetes regimen, and a negative relationship was found between chance-based locus of control and adherence to the diabetes regimen. Taher et al.[23] in their study on hypertension patients concluded that there is a direct relationship between internal health locus of control and adherence to treatment regimens

in hypertensive patients. Patients with uncontrolled hypertension were also found to have a high locus of control by chance. Therefore, it was observed that patients with internal locus of control beliefs had better compliance with the treatment regimen. Przybylski[22] found that patients with high internal locus of control beliefs had better compliance with treatment. The results obtained are consistent with these studies.

Limitations

The study was conducted with diabetic patients treated in the inpatient ward of the internal medicine department of a public hospital providing secondary health care services. The study can be conducted in a tertiary hospital with a larger sample. In addition, patients receiving treatment and those with chronic diseases other than diabetes can be included.

CONCLUSION

The mean total score obtained by the participants from the chronic disease self-management scale was moderate (mean: 64.11, min: 21–max: 105). Self-stigmatization (mean: 20.80 min: 9-max: 33), coping with stigmatization (mean: 16.39 min: 9-max: 25), and health care effectiveness (mean: 12.73 min: 8-max: 20) are at a low level. On the other hand, adherence to treatment (mean: 15.81, min: 5–max: 25) was at a moderate level.

The internal locus of control score of the participants (mean: 25.08, min: 9.9, max: 36) was found to be higher than the other sub-dimensions. It was concluded that the participants had more internal locus of control beliefs. It can be said that patients are willing to take responsibility for their illnesses themselves instead of attributing them to others. This is a desirable situation. It has been observed that positive results can be achieved when patients are given training and social support about self-management and diseases.

As a result of the correlation analyses performed with respect to individuals' diseases, statistically significant relationships were obtained between the total and sub-dimensions of chronic disease self-management and the sub-dimensions of health locus of control ($p<0.05$). As the health locus of control improves, patients' chronic self-management also increases.

ETHICAL DECLERATION

Ethics Committee Approval: In order to carry out this research, Ethics Committee Approval was received from Kırıkkale University Non-invasive Research (Date: 21.12.2022, Decision No: 2022.12.01)

Informed Consent: A signed, free, and informed consent form was obtained from all participants in this study.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

Financial Disclosure: The authors declared that this study has received no financial support.

Author Contributions: All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

REFERENCES

1. Akpınar NB, Ceran MA. Kronik hastalıklar ve rehabilitasyon hemşireliği. *Adnan Menderes Üniv Sağ Bil Fak Derg.* 2019;3(2): 140-152.
2. Centers for Disease Control and Prevention (2020). About chronic illness. https://www.cdc.gov/chronicdisease/about/index.htm/adresinden alındı. Erişim Tarihi: 20 Ocak 2023.
3. Cohen SB. The Concentration of Health Care Expenditures and Related Expenses for Costly Medical Conditions, 2012. 2014 Oct. In: Statistical Brief (Medical Expenditure Panel Survey (US)) [Internet]. Rockville (MD): Agency for Healthcare Research and Quality (US); 2001–. STATISTICAL BRIEF #455.
4. Darnikowska J, Jędrzejczak B, Dziki A, Mik M. Health locus of control among patients operated on for colorectal cancer. *Pol Przegl Chir*. 2021;93(0):1-6. doi: 10.5604/01.3001.0015.3457
5. WHO (World Health Organization). Preventing chronic diseases: a vital investment 2005: https://apps.who.int/iris/bitstream/handle/10665/43314/9241563001_eng.pdf?sequence=1&isAllowed=y/
6. Güzel A. (2017). Çok Boyutlu Sağlık Kontrol Odağı Ölçeği A ve B Formlarının Türkçe Geçerlik ve Güvenirliği. Yüksek Lisans Tezi. Hacettepe Üniversitesi Sağlık Bilimleri Enstitüsü, Ankara.
7. Hançerlioğlu S, Aykar FŞ. Kronik hastalıklarda öz bakım yönetimi ölçeği'nin Türkçe'ye uyarlanması, geçerlik ve güvenirliği. *Gümüşhane Üniv Sağ Bil Derg.* 2018;7(1):175-183.
8. Helms BGC. Self-concept, health locus of control, health beliefs and compliance in hypertensive adults (Doctoral dissertation, Mississippi University for Women). 1989.
9. Huygens MW, Vermeulen J, Swinkels IC, Friele RD, van Schayck OC, de Witte LP. Expectations and needs of patients with a chronic disease toward self-management and ehealth for self-management purposes. *BMC Health Serv Res*. 2016;16:232. doi: 10.1186/s12913-016-1484-5
10. Jamiel AA, Ardah HI, Ahmed AM, Al-Mallah MH. Prognostic value of exercise capacity in incident diabetes: a country with high prevalence of diabetes. *BMC Endocr Disord.* 2022;22(1):297. doi: 10.1186/s12902-022-01174-5
11. Kaul K, Tarr JM, Ahmad SI, Kohner EM, Chibber R. Introduction to diabetes mellitus. Adv Exp Med Biol book series. 2012;771:1-11. doi: 10.1007/978-1-4614-5441-0_1
12. Kobori T, Onishi Y, Yoshida Y, et al. Clinical features and sulfonylurea usage among outpatients with diabetes aged ≥90 years in an urban diabetes clinic in Tokyo. *J Diab Invest.* 2022;13(12):2010-2017. doi: 10.1111/jdi.13901
13. Korucu N. Koroner arter hastalığı olan bireylerde sağlık kontrol odağı ile kişilik özellikleri arasındaki ilişkinin incelenmesi. Yüksek Lisans Tezi. Ege Üniversitesi Sağlık Bilimleri Enstitüsü, İzmir.
14. Kurt D. Hipertansiyon tanısı alan hastalara verilen öz yönetim desteğinin bilgi düzeyi, tedaviye uyum ve öz bakım yönetimine etkisi. Doktora Tezi. Trakya Üniversitesi Sağlık Bilimleri Enstitüsü, Trakya. 2020.

15. Marton G, Pizzoli SFM, Vergani L, et al. Patients' health locus of control and preferences about the role that they want to play in the medical decision-making process. *Psychol Health Med*. 2021;26(2):260-266. doi: 10.1080/13548506.2020.1748211
16. Morowatisharifabad M, Mazloomy Mahmoodabad S, Baghianimoghadam M, Rouhani Tonekaboni N. Relationships between locus of control and adherence to diabetes regimen. *J Res Health Sci*. 2009;9(1):37-44.
17. Ngai SS, Cheung CK, Ng YH, et al. Time effects of supportive interaction and facilitator input variety on treatment adherence of young people with chronic health conditions: a dynamic mechanism in mutual aid groups. *Int J Environ Res Public Health*. 2021;18(6):3061. doi: 10.3390/ijerph18063061
18. Özdamar K. SPSS ile Biyoistatistik. Kaan Kitabevi; Eskişehir. 2003.
19. Öztürk YE, Yeşildal M, Arık Ö, Fidan Y. Kronik Hastalık Öz Yönetim Ölçeği'nin Türkçe geçerlilik güvenilirliği. *J Acad Value Stud.* 2021;7(3):375-381.
20. Papadakos JK, Hasan SM, Barnsley J, et al. Health literacy and cancer self-management behaviors: a scoping review. *Cancer.* 2018;124(21):4202-4210. doi: 10.1002/cncr.31733.
21. Petricek G, Vuletić Mavrinac G, Vrcić-Keglevic M. Procjena zdravstvenog lokusa kontrole bolesnika sa secernom bolescu tip 2 [health locus of control assessment in diabetes mellitus type 2 patients]. *Acta Med Croatica*. 2009;63(2):135-143. Croatian.
22. Przybylski M. Health locus of control theory in diabetes: a worthwhile approach in managing diabetic foot ulcers? *J Wound Care*. 2010;19(6):228-233. doi: 10.12968/jowc.2010.19.6.48470
23. Taher M, Safavi Bayat Z, Niromand Zandi K, et al. Correlation between compliance regimens with health locus of control in patients with hypertension. *Med J Islam Repub Iran*. 2015;29:194.
24. Trento M, Tomelini M, Basile M, et al. The locus of control in patients with Type 1 and Type 2 diabetes managed by individual and group care. *Diab Med*. 2008;25(1):86-90. doi: 10.1111/j.1464-5491.2007.02319.x
25. Ulamış B, Özmen D. Bir kamu hastanesinde çalışan hemşirelerin sağlıklı yaşam biçimi davranışları ile sağlık kontrol odağı arasındaki ilişki. *İzmir Tepecik Eğit Hast Derg.* 2014;24(2):119-125.
26. Yurttaş A, Özmen S, Kant E, Balcı Akpınar, R. Multipl sklerozlu hastalarda öz yeterlilik ve sağlık kontrol odağı arasındaki ilişki. Türkiye Klinikleri J Nurs Sci. 2021;13(2):310-317. doi: 10.5336/nurses.2020-77455 İndeks
27. Zhang X, Chen H, Liu Y, Yang B. Influence of chronic illness resources on self-management and the mediating effect of patient activation among patients with coronary heart disease. *Nurs Open*. 2021;8(6):3181-3189. doi: 10.1002/nop2.1031
28. https://sggm.saglik.gov.tr/TR-76887/dunya-diyabet-gunu-2020.html